Rethinking Archives as Digital: The Consequences of "Paper Minds" in Illustrations and Definitions of E-archives

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RÉSUMÉ La culture et les discours affectent notre compréhension des archives dans l'environnement numérique : les idées préconçues, les normes et les pratiques développées dans une administration fondée sur le support papier influencent et limitent nos perceptions des archives numériques. Il peut être difficile d'imaginer autrement les archives dans le contexte de la cyberadministration et de l'environnement réseauté dans lequel les questions archivistiques deviennent plus complexes. Ceci est un problème global puisque les exigences en matière de documents numériques sont différentes de celles pour les documents sur support papier. Cet article emprunte une approche discursive, se concentrant sur « les ouvertures » et « les fermetures » de concepts autour de l'idée des archives dans les administrations municipales suédoises. La théorie critique sert de lentille à travers laquelle on peut comprendre les archives de façon générale et les archives numériques de façon particulière.

L'analyse est effectuée après avoir établi trois principes de base que l'administration publique en Suède devrait viser : (i) adopter un concept holistique des archives; (ii) préconiser une approche proactive en matière de gestion de documents; et (iii) s'efforcer d'intégrer le processus archivistique dans les objectifs et les occasions de la cyberadministration. Les conclusions révèlent que le manque de « fermetures », c'est-à-dire des principes qu'on comprend de la même façon et une définition commune des archives numériques, peut restreindre la compréhension des archives dans des contextes numériques et contraindre le développement de leur plein potentiel. Du même coup, le manque « d'ouvertures » vis-à-vis des nouvelles façons d'envisager et de concevoir les archives numériques peut limiter l'étendue de possibilités que peuvent offrir les formats numériques. « L'esprit papier » peut présupposer une progression par étapes, à partir de stade actif jusqu'au stade archivistique, qui est inutile dans le contexte numérique.

ABSTRACT Culture and discourses affect our understanding of the archive in the digital environment: preconceptions, norms, and practices developed in a paper-based administration colour and limit perceptions of digital archives. It can be difficult to reimagine the archive in the context of e-government and the networked environment, where the complexity of archival issues increases. This is a global problem, because the requirements of digital records are different from those of paper records. This article takes a discursive approach, focusing on "openings" and "closings" of concepts surrounding the idea of archives in Swedish municipal governments. Critical theory is

used as a lens through which we understand archives in general, and digital archives in particular.

The analysis is made after establishing three basic principles that public administration in Sweden should work toward: (i) adopting a holistic concept of the archive; (ii) taking a proactive approach to records management; and (iii) striving to integrate the archiving process with the goals and opportunities of e-government. The result indicates that the lack of "closings," i.e., commonly understood principles and a shared definition of an e-archive, may restrict the understanding of archives in digital contexts and constrain the development of their full potential. At the same time, the lack of "openings" toward new ways of thinking about and designing e-archives may narrow the scope of possibilities that the digital formats can offer. "Paper minds" may presuppose a stepwise progression of records, from active to archival, that is unnecessary in the digital context.

Introduction

What traces of the analog archive are embedded in the discourse on digital archives? And what implications might this have for the development of technical solutions? Archival principles and practices, largely developed in an analog administration, are confronted by new challenges arising from the increased use of digital formats. In the words of Terry Cook, "despite the consequent need to reorient or reinvent or reconceive our work, almost all the concepts, practices, procedures, and even accepted terminology of the profession reflect our legacy of paper records. We have paper minds trying to cope with electronic realities."[1] There are various aspects to this problem. The one in focus in this article concerns the need to rethink existing principles and practices when planning new ways to ensure long-term preservation of public records, a task that can be problematic when "for the first time, we are not producing, managing, and saving physical things or artifacts, but rather trying to understand and preserve logical and virtual patterns that give electronic information its structure, content, and context."[2] If we draw an analogy from Cook, the aim of this article is to explore whether "paper minds" currently affect planning for creating digital archives, even though technical development has fundamentally changed the ways records are created, handled, and used, and extensive research and investments have been aimed at adapting existing practices to the new context. As Anneli Sundqvist and Proscovia Svärd put it,

1   Terry Cook, "Electronic Records, Paper Minds: The Revolution in Information Management and Archives in the Post-Custodial and Post-Modernist Era," *Archives & Social Studies: A Journal of Interdisciplinary Research* 1 (2007): 403–4, accessed 17 March 2017, http://archivo.cartagena.es/files/36-164-DOC_FICHERO1/06-cook_electronic.pdf.
2   Ibid., 402.

"despite investments in technology and legal frameworks that governs [*sic*] the management of information resources, many organizations still grapple with the implementation of good information and records management practices. A lot of knowledge has been produced within the records management community that should have mitigated these problems by now with all the technical advancements present, but attaining good information and records management is still a challenge in most organizations. Apparently, there must be other, less tangible, factors that impact on information and records management."[3]

The present article is an attempt to address one of these "less tangible factors," namely, the discourse of archives: what they are and what they should be. The result demonstrates that paper minds are still affecting the planning for creating digital archives.

The concept of the archive

Regardless of the medium, all archives contain information preserved in context, or *process-bound information*,[4] yet the concept of the archive is multi-faceted and can be defined and understood in different ways.[5] According to Richard Cox, common perceptions of archives (and also libraries) include "seeing them as repositories of interesting stuff, documents and artifacts, all of human history, all of human memory and knowledge, and simply as one more source of entertainment."[6] The wide scope of possible understandings naturally narrows in certain contexts: national legislation, archival traditions, and the technical resources available may circumscribe and specify what an archive is. Public archives are a specific form of archives that have long been a cornerstone in public administration and can therefore be described as "authoritative sources of information."[7] However, they are not always perceived in this way, something that has been described as problematic by both scholars and professionals. In 1993, Sue McKemmish and Frank Upward wrote:

3   Anneli Sundqvist and Proscovia Svärd, "Information Culture and Records Management: A Suitable Match? Conceptualizations of Information Culture and Their Application on Records Management," *International Journal of Information Management* 36, no. 1 (February 2016): 9.

4   Theo Thomassen, "A First Introduction to Archival Science," *Archival Science* 1, no. 4 (December 2001): 373–85.

5   For example, as a building, a collection of records, an information system, or an institution.

6   Richard J. Cox, *Vandals in the Stacks? A Response to Nicholson Baker's Assault on Libraries* (London: Greenwood Press, 2002), 20.

7   Sue McKemmish, "Traces: Document, Record, Archive, Archives," in *Archives: Recordkeeping in Society*, ed. Sue McKemmish, Michael Piggott, Barbara Reid, and Frank Upward (Wagga Wagga, NSW: Centre for Information Studies, Charles Sturt University, 2005), 14.

Most people have at least a rudimentary understanding of information as an allocative resource in the sense of an information product, but the absence in the Australian community of general understandings of its authoritative nature, its role in governing our relationships over space and time, makes life more difficult for archivists, and threatens the coherence of Australian society.[8]

A more recent expression of this problem in a European context is the "Italian Archivists Manifesto," which describes archives as largely "invisible" despite their societal importance.[9] What follows is a critical analysis of how we understand archives in general and digital archives in particular.

Scope and Objective

The physical constitution of paper records differs from that of digital records. The present article focuses on how the discourse about analog archives carries over, or "travels" into, and colours thoughts on what a digital archive is and ought to be. Digital technology has been described as a "material without qualities"[10] that can be used to create virtually anything. This reality makes the design of digital artifacts (systems, programs, or products) an open and complex process. How the design is framed is important for understanding the process of its becoming, which is a reason to study this process closely. The research questions addressed are:

- What norms and elements of the analog concept of the archive might carry over, or "travel" into, the discourse of digital archives?
- How might these norms and elements affect the plans for creating digital archives?

Strategies for managing digital records are under development regarding, for example, how to preserve the metadata needed to understand the content of the records over time. International examples of work in this area include the PREMIS *Data Dictionary for Preservation Metadata*, an "international standard for metadata to support the preservation of digital objects and ensure

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8   Sue McKemmish and Frank Upward, eds., "General Introduction," in *Archival Documents: Providing Accountability through Recordkeeping* (Melbourne: Ancora Press, 1993).

9   The Italian National Association of Archivists (ANAI), "Italian Archivists Manifesto" (2016), accessed 17 March 2017, http://www.ica.org/sites/default/files/Manifesto_Italian _archivists_ENG.pdf.

10   Jonas Löwgren, *Design av informationsteknik: materialet utan egenskaper* [Design of Information Technology: The Material without Properties], ed. Erik Stolterman, 2nd ed. (Lund, Sweden: Studentlitteratur, 2004).

their long-term usability"[11]; the AC+erm Project, a research project of the School of Computing, Engineering and Information Sciences at Northumbria University, Newcastle upon Tyne, UK, that aimed to "investigate and critically explore issues and practical strategies to support accelerating the pace of positive change in managing electronic records"[12]; and InterPARES Trust, a multinational, interdisciplinary research project that explores issues concerning digital records and data entrusted to the Internet.[13] In Sweden, studies, reports, and projects at national, regional, and municipal levels also address issues involved in handling and preserving digital records.[14]

In this article, three pre-study reports created in the municipal sector in Sweden, along with the illustrations employed in the reports to explain and clarify the concept of an archive, provide the basis for an exploration of the development of the concept of the archive in the digital environment. Pre-studies are made before, or in the very first phase of, a business development project in the public sector. Their aim is to investigate context and conditions and discuss what efforts are needed to address perceived problems. Pre-studies should outline the possible scope and objectives of a project, identify stakeholders, and make recommendations for further actions. The result of a pre-study is usually a pre-study report, which discusses the feasibility of the project, provides calculations of the time and costs, and outlines expected financial commitments required to meet the goals of the project. It is then up to the agency that ordered the pre-study to decide whether to proceed or, in cases where several different approaches are presented, to choose the one that is the most appropriate. A pre-study report generally includes the following headings:

- Background, goals, and purpose
- Extent
- Limitations
- Situation analysis
- Interest analysis
- Requirement specification(s)

11   Library of Congress, Standards, PREMIS, accessed 3 March 2017, http://www.loc.gov/standards/premis.
12   Julie McLeod, Sue Childs, and Rachel Hardiman, *AC+erm Project Final Project Report* (Newcastle upon Tyne, UK: Northumbria University, 2010), accessed 3 March 2017, https://www.northumbria.ac.uk/static/5007/ceispdf/final.pdf.
13   InterPARES Trust, accessed 3 March 2017, https://interparestrust.org.
14   Arkivutredningen Arkiv för alla, *Arkiv för alla – Nu och i framtiden: betänkande [Archives for All – Now and in the Future: Report]*, Statens offentliga utredningar 2002: 78 (Stockholm: Fritzes Offentliga Publikationer, 2002); Göran Kristiansson, *Att bevara digitala handlingar: förslag till framtida inriktning [To Preserve Digital Documents: Proposal for Future Orientation]* (Stockholm: Riksarkivet, 2006); Karl Wessbrandt, *Förstudierapport om framtidens elektroniska arkiv* [Pre-Study Report on the Future of Electronic Archives], (Stockholm: Statskontoret, 2003).

- Suggested solutions
- Profitability analysis
- Milestone plan

A pre-study may result in the initiation of an investigation, a planning phase, closure, or a re-referral study. As an example of the process, in 2011 an official report[15] concluded that fully digital work processes should be implemented for the registries and archives of all state public agencies. In 2013, the Swedish government ordered a pre-study to be carried out concerning an extension of the range of services provided by the Statens servicecenter (State Service Centre, hereafter SSC).[16] The pre-study gave "an overarching image of problems and possibilities,"[17] and concluded that substantial costs could be saved by implementing a national e-archive. In 2014, the Swedish government decided to give the SSC, in collaboration with the National Archives, the mandate to develop a national e-archive.[18]

Research context

In Sweden, where the present study took place, the rules and regulations for managing archives are format independent. All technical solutions should be adapted to fulfill legal requirements, but because core concepts are interpreted in different ways in different cultural and legislative contexts, it can be difficult to grasp (i) what a "record" or an "archive" is; and (ii) what needs to be done to create, manage, and preserve them.[19] The concept of the "e-archive" lacks a formal definition.[20] According to a glossary created in

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15   [Sweden. E-delegation], *Så enkelt som möjligt för så många som möjligt – En bit på väg* [As Simple as Possible for as Many People as Possible: Some Progress: Report], SOU 2011: 67 (Stockholm: Statens Offentliga Utredningar, 2011).

16   [Sweden. Ministry of Industry], *Med medborgaren i centrum. Regeringens strategi för en digitalt samverkande statsförvaltning* [With the Citizen in the Centre: The Government's Strategy for a Digital Collaborative Public Administration] (Stockholm: Regeringskansliet, 2013).

17   Jan Aspenfjäll, *Förstudie Statens servicecenter e-arkiv och e-diarium* [Pre-study State Service Center E-archive and E-registry] (Stockholm: Riksarkivet, 2013), 5.

18   [Sweden. Ministry of Industry], "Uppdrag att utveckla gemensamt e-arkiv" [Mandate to Develop a National E-archive], 2014.

19   Erik Borglund and Tove Engvall, "Open Data?: Data, Information, Document or Record?" *Records Management Journal* 24, no. 2 (2014): 163–80; Fia Ewald, "Arkivbildarbegreppet och proveniensprincipen under press" [The Concept of Archive Creator and the Principle of Provenance under Pressure], *Arkiv samhälle och forskning* 3 (1997); Ann-Sofie Klareld, "Adapting Official Archives Management to the Context of E-government" (licentiate thesis, Mid Sweden University, 2015).

20   Ann-Sofie Klareld, "'Isn't It Information Assets We're Really Talking About?' A Discourse Analysis of a Panel Discussion on Digital Archives," *Archives and Records* 36, no. 2 (2015): 167–78.

2013 by a project run by the Swedish National Archives, the concept "may have the same constitutional meaning as 'archive' but referring to electronic documents in the public agency's archives, and colloquially refer to an 'archive system.'"[21] This rather vague formulation leaves unanswered the question about the relationship between analog and digital archives.[22]

Recent developments

The national e-archive solution for state public agencies in Sweden is currently under development by the SSC and the National Archives.[23] The SSC, established in 2012, is a public agency within the Ministry of Finance that offers to other state agencies services related to payroll administration, financial management, and e-commerce.[24] Counties and municipalities are not able to use this service since there are strict boundaries between the state and the regional public administrations. Instead, they must implement their own solutions. Of relevance for both state and regional/municipal public agencies is the result of eARD, a project initiated by the eGovernment Delegation, a committee of the Ministry for Industry. It was implemented by the National Archives between 2011 and 2014. The aim of the eARD project was to develop common specifications for transferring information between business systems and e-archives. The vision of the project was that "it should be easy to retrieve, reuse, and transfer information held by public agencies to the archive regardless of where and how the information is stored."[25]

As a way to facilitate the implementation of e-archives in the regional and municipal sector, SALAR, the Swedish Association of Local Authorities and Regions,[26] has procured a framework agreement covering purchase of an

21 Riksarkivet [Swedish National Archives], "Delprojekt 1 (Dp1) inom e-arkiv och e-diarium (Begreppsdefinitioner) Ordlista" [Subproject 1 within E-Archive and E-Diarium (Concept Definitions) Glossary], Version 1:1, 14 January 2013, accessed 3 March 2017, https://riksarkivet.se/Media/pdf.../eARD_Begreppslista_DP1_v2.xls.

22 Swedish state public agencies and those of the counties and municipalities are supervised by different archival authorities: The National Archives is responsible for state public agencies, while each county and municipality has its own archival authority. Many counties and municipalities follow the National Archives' guidelines although they are not legally required to do so.

23 Anna-Karin Hatt and Juha Alskog, "Uppdrag att utveckla gemensamt e-arkiv" [Mandate to Develop a National E-archive], Näringsdepartementet [Ministry of Industry], announcement, 14 August 2014.

24 Statens servicecenter [State Service Center (SSC)], "Om Oss" [About Us], accessed 3 March 2017, http://www.statenssc.se/OmOss/Sidor/default.aspx.

25 Riksarkivet, "The e-Archive and e-Diarium Project, eARD," accessed 7 March 2014 (no longer accessible), http://riksarkivet.se/Media/pdffiler/Projekt/eARD_informationstext_eng.pdf.

26 Sveriges Kommuner och Landsting, "Swedish Association of Local Authorities and Regions," accessed 3 March 2017, http://skl.se/tjanster/englishpages.411.html.

e-archive as a product or service, including the possibility of subcontracting consulting services.[27] Implementation of an e-archive can be achieved through co-operation: an example of a joint e-archive is R7, a partnership that today includes nine counties.[28]

Despite these and other recent projects and investments, a report by the SSC states that public agencies have a tendency to postpone measures for preservation: "The question is whether all agencies of the state administration are even budgeting for preservation, and how much knowledge there is about what the formal requirements mean as regards technical preservation."[29] The results of the study reported in this article indicate that this question is also relevant in the regional and municipal administrations.

Theoretical Framework

The relationship between technological achievements and societal change can be understood from a variety of perspectives. Although it is possible to talk about change when new technologies are introduced, we argue that statements like "technology introduction X leads to consequence Y" are superficial and insufficient. Instead, what is interesting is how the story is structured: what is put forward, what is hidden, and what is given legitimacy. According to Andrew Feenberg, we "enact" the world when we create it in the context of culture and previous experience, which is why technology cannot be seen as "neutral": "there is no such thing as technology 'in itself' since technologies exist only in the context of one or another sort of employment."[30] To address issues of change, several ambitions have been formulated for critical studies of information systems, such as questioning (i) economic-technical rationalism, (ii) technology-driven development models, and (iii) positivistic superiority in terms of valuable knowledge,[31] together with an objective to enhance empirical studies in critical information systems studies.[32] This article does

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27 Sveriges Kommuner och Landsting, Näringsliv, arbete, digitalisering, "E-arkiv" [Swedish Association of Local Authorities and Regions, Business, Labor, Digitization, "E-archives"], accessed 17 March 2017, http://skl.se/naringslivarbetedigitalisering/digitalisering/eforvaltningearkiv/earkiv.350.html.

28 R7, "Så här fungerar det" [This Is How It Works], accessed 3 March 2017, http://www.r7earkiv.se/fungera.html.

29 SSC, *En förvaltningsgemensam tjänst för e-arkiv – delrapport* [A Common Management Service for E-Archives – Interim Report] (Gävle, Sweden: Statens servicecenter, 2015), 10.

30 Andrew Feenberg, *Transforming Technology: A Critical Theory Revisited*, rev. ed. (Oxford, UK: Oxford University Press, 2002), 45.

31 Kalle Lyytinen, "Information Systems and Critical Theory," in *Critical Management Studies*, ed. Mats Alvesson and Hugh Willmott (London: Sage, 1992), 159–80.

32 Dubravka Cecez-Kecmanovic, Heinz K. Klein, and Carole Brooke, "Exploring the Critical Agenda in Information Systems Research," *Information Systems Journal* 18, no. 2 (March 2008): 123–35.

not explicitly link to these three areas of interest, but is instead more closely linked to the critical tradition in terms of questioning existing forms of knowledge production, especially hegemonic discourses (things taken for granted) and their embodiment in different processes. This is more in line with Wanda J. Orlikowski and Jack J. Baroudi's understanding of the critical stance, as the focus is on the taken-for-granted assumptions and the objective is to expose deep-seated structures.[33] This approach also aligns with Geoff Walsham's emphasis on construction and enactment and on historical and cultural contingencies.[34] According to Craig Calhoun, "Our knowledge is always situated, but also framed in relation to action – starting even with projects of understanding – that orient us beyond our initial situations."[35] Critical theory uses the terms "openings" and "closures" to mean stories and concepts that are elevated or foregrounded at the expense of other possible concepts.

A common understanding of the connection between technology and societal change is that in the late 19th and early 20th centuries, the typewriter and the copying machine gave rise to new ways of using records in business organizations,[36] and that similar changes can be observed today, with the introduction of digital technology and the emergence of e-government, which requires adaptation of existing routines and procedures to fit new conditions. This is, however, only part of the story. The theoretical framework used in this article aims to question the taken-for-granted character of existing forms of enactment and construction in relation to archives creation. As Steven Lubar puts it, "Archives reflect not just technologies … but also the changes in culture that accompany changing technology."[37] Currently, organizations are changing from hierarchical, structurally fixed entities that are stable over time into complex and constantly changing networks,[38] a change that affects administration, legislation, and information governance. Critical, reflexive research on technological development highlights the social dimensions of the processes studied: technical objects are also social objects. The focus on knowledge production and enactment of stories implies that every statement needs to be understood as one story told, excluding other possible stories. Our standpoint is

33 Wanda J. Orlikowski and Jack J. Baroudi, "Studying Information Technology in Organizations: Research Approaches and Assumptions," *Information Systems Research* 2, no. 1 (March 1991): 1–28.
34 Geoff Walsham, "Learning about Being Critical," *Information Systems Journal* 15, no. 2 (April 2005): 111–17.
35 Craig Calhoun, *Critical Social Theory: Culture, History, and the Challenge of Difference* (Oxford: Blackwell, 1995), 120.
36 JoAnne Yates, *Control through Communication: The Rise of System in American Management* (Baltimore, MD: Johns Hopkins University Press, 1993).
37 Steven Lubar, "Information Culture and the Archival Record," *American Archivist* 62, no. 1 (Spring 1999): 12.
38 Cook, "Electronic Records, Paper Minds," 402.

that technologies developed to facilitate archives management are influenced by discourses: not only discourses on archives, but also discourse in related areas such as governance and bureaucracy, to name just two. Discourses shape, organize, and circumscribe reality: we "produce" society by acting and speaking about it as an objective entirety.[39] Discourses are an important part of this production as historically specific systems of meaning that form the identities of subjects and objects,[40] consequently affecting perceived problems, opportunities, and solutions. In other words, discourse sets a "framework" for technological development and use. For example, there are different ways of reasoning about the relationship between information management and technical development. In 1992, Swedish archival scholar Torbjörn Kjölstad argued that information management ought to consider "the tension that arises between technological development, which in many respects is its own goal, and our own willingness and ability to control and exploit technology for the purposes we consider important."[41] This rather passive notion of technology as a goal in itself is in contrast with the current definition of e-government, which instead emphasizes that technologies should be used for certain predefined purposes: "the use of information and communication technologies in public administrations combined with organizational change and new skills in order to improve public services and democratic processes and strengthen support to public policies."[42] These two examples touch upon the complex relationship between the goal and the consequence.

The systems of rules that legitimize discourses change continuously.[43] Using a critical approach, dominant perceptions can be questioned,[44] and new perspectives on existing categorization, theoretical practice, and aporia and/

39 Marianne Winther Jørgensen, Louise Phillips, and Sven-Erik Torhell, *Diskursanalys som teori och metod* [Discourse Analysis as Theory and Method], ed. Louise Phillips and Sven-Erik Torhell (Lund, Sweden: Studentlitteratur, 2000), 47.

40 Michel Foucault, *Vetandets arkeologi* [The Archaeology of Knowledge], ed. C. G. Bjurström and Sven-Erik Torhell (Lund, Sweden: Arkiv, 2002).

41 Torbjörn Kjölstad, "Kompetens för framtidens informationsförsörjning" [Skills for the Future of Information Management], *Tidskrift för dokumentation* [The Nordic Journal of Documentation] 47, no. 4 (1992): 103.

42 Commission of the European Communities, *The Role of eGovernment for Europe's Future* (Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, 26 September 2003), accessed 3 March 2017, http://eur-lex.europa.eu/LexUriServ/LexUriServ .do?uri=COM:2003:0567:FIN:EN:PDF.

43 Göran Bergström and Kristina Boréus, *Textens mening och makt: Metodbok I samhällsvetenskaplig Text – Och Diskursanalys* [The Power and Meaning of Text: Methods of Social Science Text – and Discourse Analysis], ed. Göran Bergström and Kristina Boréus, 2nd ed. (Lund, Sweden: Studentlitteratur, 2005).

44 Ludvig Beckman, *Grundbok I idéanalys: det kritiska studiet av politiska texter och idéer* [Idea Analysis: The Critical Study of Political Texts and Ideas] (Stockholm: Commission of the European Communities, 2005).

or contradictions are made visible.[45] According to Calhoun, critical theory provides a means of "critically grasping both the ways in which our categories of thought make the world what it is, and the possibilities for change in those existing conditions."[46] The emphasis of this article is on how a particular story achieves supremacy. Images or metaphors are important in relation to discourses, because they structure the way we think and act: by choosing one metaphor instead of another, we construct our perception of reality.[47]

Studying Illustrations

Complex concepts, such as e-archives, are sometimes described using simplified images accompanied by explanatory text. The use of diagrammatic representations and models can be a way to communicate ideas and insights within and outside of the archival community. Diagrammatic representations are common in recordkeeping; examples include the records life cycle, the records continuum, and the digital curation life cycle. Current conceptual and practical work around digital preservation methods and systems has also been made more comprehensible to a wider community by using diagrams in the Open Archival Information System Reference Model (OAIS).[48] Another example is the use of conceptual models in the metadata standard *ISO/TS 23081-2*.[49]

The study of visualizations and diagrammatic representations has emerged as a research field in a number of disciplines simultaneously, including cognitive science, information science, and artificial intelligence.[50] Though a deeper engagement with this domain is outside the scope of this article, the communicational aspect is relevant in relation to e-archives since their implementation requires that archivists and records managers co-operate with professionals in other areas of expertise (for example CIOs, software engineers, and legal advisers). A pre-study report is one example in which concepts and ideas need

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45 Calhoun, *Critical Social Theory*, 134.

46 Ibid., 284.

47 Björn Eliasson, *Diskurser om informationssamhället* [Discourses on the Information Society], Karlstad University Studies 2005: 38 (Karlstad, Sweden: Karlstads Universitet, 2005).

48 International Organization for Standardization, *ISO 14721:2012, Space Data and Information Transfer Systems – Open Archival Information System (OAIS) – Reference Model*, 2nd ed., accessed 17 March 2017, https://www.iso.org/standard/57284.html.

49 International Organization for Standardization, *ISO/TS 23081-2:2007, Information and Documentation – Records Management Processes – Metadata for Records – Part 2: Conceptual and Implementation Issues*, accessed 17 March 2017, https://www.iso.org/standard/43390.html.

50 Michael Anderson, Peter Cheng, and Volker Haarslev, eds., *Theory and Application of Diagrams: Proceedings of the First International Conference, Diagrams 2000 Edinburgh, Scotland, UK, September 2000*, Lecture Notes in Artificial Intelligence, vol. 1889, ed. J.G. Carbonell and J. Siekmann (Berlin: Springer, 2000).

to be explained and presented to decision makers who may not be well versed in the field of recordkeeping and archives management.

Conceptual modelling is an area of research within computer science and engineering. A model can be described as "a representation of some object, behavior, or system that one wants to understand."[51] According to Jeffrey Parsons and Linda Cole, "A primary purpose of conceptual modeling is to facilitate communication between analysts and users in validating domain knowledge during systems development."[52] The present article does not focus on pre-study illustrations per se; instead, the illustrations are treated as part of the discourse on analog and digital archives. Each pre-study is read as a separate story, with statements and visual illustrations that leave out some things while putting others in the centre of the tale of the digital archive and its management.

Material and Method

The empirical material is a set of pre-study reports that focus on e-archives. The pre-studies were chosen for critical analysis since they provide examples of how the concept of a digital archive can be understood. The theoretical framework of critical studies provides a methodological guideline for identifying and questioning taken-for-granted perceptions.[53] Such an approach is highly appropriate for problematizing technical solutions in relation to the context and purpose in which they are used.

Several of Sweden's 290 municipalities and 20 counties have recently conducted pre-studies related to digital archiving, although there is no official figure for how many have been done. The three pre-studies in question here were chosen from among 15 of the participating bodies in a recent survey on digital services.[54] It concluded that extensive development was in progress to ensure long-term preservation of information in public organizations, yet it found that only three municipalities, of which two were metropolitan, had implemented an e-archive.

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51 *Internet Encyclopedia of Philosophy*, s.v. "Models," accessed 3 March 2017, http://www.iep .utm.edu/models.
52 Jeffrey Parsons and Linda Cole, "What Do the Pictures Mean? Guidelines for Experimental Evaluation of Representation Fidelity in Diagrammatical Conceptual Modeling Techniques," *Data & Knowledge Engineering* 55, no. 3 (December 2005): 327–42.
53 Mats Alvesson, *Kritisk samhällsvetenskaplig metod* [Critical Social Science Methodology], ed. Stanley Deetz and Sven-Erik Torhell (Lund, Sweden: Studentlitteratur, 2000).
54 Swedish Association of Local Authorities and Regions (SALAR), *Kartläggning anslutning till nationella digitala tjänster* [Survey Connection to National Digital Services] (Stockholm: SALAR, 2015).

The selected pre-studies were reviewed. Five included illustrations or conceptual diagrams. Three of these five contained similar representations, and because the intention of the present study was to compare different conceptualizations and certain variation was sought, only one of these was included in the analysis. The three reports finally selected are here called Reports A, B, and C. Each includes descriptions of problems in the current situation and suggests an e-archive as the solution. All have similar scope and objectives: to serve as the basis for decisions and to include recommendations on digital archiving, and each also includes definitions and illustrations of the concept of the e-archive. The reports were completed between late 2013 and early 2014. Report A was the result of a study conducted by representatives from the various business units of a single municipality. Report B was the outcome of co-operation among 13 municipalities belonging to the same county and the county council. Report C was completed by a working group on e-archives in a municipality and was commented on by a group of experts.

The material was analyzed by (i) closely examining the pre-studies to question the way digital archives are described and depicted; (ii) comparing the pre-studies, in which every statement on what e-archives are is understood as one story told, excluding other possible stories (i.e., openings and closings in relation to the idea of e-archives); and (iii) drawing parallels with existing practices and principles and questioning the taken-for-granted character of existing forms of enactment and construction of e-archives.

Results

The results are presented in two sections: the first section describes the overall principles and practices relevant to the context of the three pre-studies. The second part is a narrower analysis of the differences, focusing on openings and closings of what e-archives are and ought to be.

Principles

Established principles (legal frameworks, standards, rules, norms, etc.) could be understood as more slow-moving and fixed constructions to which all pre-studies need to refer in one way or another. In this study, they are viewed as a shared background but are not the central object of the study. The more detailed analysis is instead focused on the specific strategies for translating the principles into shared practices in the digital environment, and how this translation is affected by practices developed in an analog administration.

The main laws regulating recordkeeping and archives creation in Swedish public agencies are the *Archives Act*,[55] the *Public Access to Information and Secrecy Act*,[56] the *Freedom of the Press Act*,[57] and the *Data Protection Act*.[58] The concept of the *archive* is defined in the *Archives Act*, section 3: "An agency's archive is formed by the public records of the agency's activities."[59] All public archives are considered part of cultural heritage. According to the *Freedom of the Press Act* (section 3), a *record* is "any written or pictorial matter or recording which may be read, listened to, or otherwise comprehended using only technical aids."[60] The legal framework builds on the principle that all public agencies own and are responsible for their records until destruction or formal transfer to an archival authority. Records created or received by public agencies are to be preserved, kept in order, and handled in ways that ensure the following: "1. The right of free access to public records; 2. The information requirements of the public jurisdiction and administrations; and 3. Research requirements."[61]

Swedish municipalities (the authors of the pre-studies) are free to organize their records management as they choose, provided that relevant rules and regulations are followed. However, the national goal of e-government development is that the public administration work together toward the same basic principles, including (i) a holistic concept of the archive, (ii) a proactive approach to records management, and (iii) an effort to integrate the archiving process with the goals and opportunities of e-government. These principles, though seen here in the light of Swedish public administration, are also relevant from an international perspective. For example, the Records Continuum Model[62] advocates that records are archival from the point of creation; *ISO 23081*[63] provides generic guidance for records metadata in relation to the creation, capture, and control of records; and the OAIS model[64]

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55 Svensk Författningssamling (SFS) [Swedish Code of Statutes], "Arkivlag" [Archives Act] (1990: 782).

56 SFS, "Offentlighets – Och Sekretesslag" [Public Access to Information and Secrecy Act] (2009: 400).

57 SFS, "Tryckfrihetsförordning" [Freedom of the Press Act] (1949: 105).

58 SFS, "Personuppgiftslag" [Data Protection Act] (1998: 204).

59 SFS, "Arkivlag."

60 SFS, "Tryckfrihetsförordning."

61 SFS, "Arkivlag."

62 Frank Upward, *Structuring the Records Continuum – Part One: Postcustodial Principles and Properties*, accessed 3 March 2017, http://www.infotech.monash.edu.au/research/groups/rcrg/publications/recordscontinuum-fupp1.html (Melbourne, Australia: Monash University Information Technology, 1998).

63 International Organization for Standardization, *ISO/TS 23081-1:2006, Information and Documentation – Records Management Processes – Metadata for Records – Part 1: Principles*, accessed 17 March 2017, https://www.iso.org/standard/40832.html.

64 International Organization for Standardization, *ISO 14721:2012*.

states that an archive consists of an organization of persons and systems that have accepted the responsibility to preserve information and make it available to a designated community. Principles like these can be seen as part of a wider discourse on digital archives, and they are currently discussed and communicated using illustrations in combination with written text. Critically analyzing documentation and representation of the digital archiving process in the light of these three overarching principles revealed inconsistencies and problematic features in the three pre-study reports.

Practices

In a paper environment, the archiving process in Swedish public offices usually follows an established set of practices: active cases are kept in the office of the administrative officer, and inactive cases are moved to a "near archive," a separate room close by, permitting easy access. When the need for regular access declines, the records are moved to a "central archive" (often located in the basement). At this stage, the records are commonly prepared for long-term preservation: they are put in labelled archive boxes and documented in a finding aid. These preparations are required before an archival authority will agree to assume ownership of and responsibility for the records. Transfer is usually considered when there is limited physical space or when an agency ceases to exist. There is no set period after which transfer is mandatory. Though the formal concept of the archive is that it includes all official records, it is often perceived to include only records in the later stages of the archiving process.

Practices for the archiving process in the digital environment are still developing, and while some public agencies have implemented an e-archive or a middle archive,[65] an established "route" from records creation at the public agency to long-term preservation at the archival authority is not yet in place. The potential consequences of this are discussed below in relation to the pre-studies.

Though each public agency is required to implement routines and solutions appropriate for managing records regardless of the format, only a few are currently able to ensure long-term preservation of records created in business systems, e-services, and word-processing programs.[66] The National Archives has stressed the need for a proactive approach: "In today's administration

65 Ann-Sofie Klareld, "The 'Middle Archive': Exploring the Practical and Theoretical Implications of a New Concept in Sweden," *Records Management Journal* 25, no. 2 (2015): 149–65.

66 Thomas Gäfvert and Elisabeth Jarborn, *Rapport rörande enkätundersökning – myndigheters hantering av elektroniska handlingar* [Report Concerning Survey – Authorities' Handling of Electronic Records] (Stockholm: Riksarkivet, 2010).

agencies are expected to streamline their information management with the support of automated case processes and e-services … it is important to have tools for information governance that contribute to both efficiency and legally secure handling."[67]

Report A

Report A defines the concept of the e-archive as "all electronic records, regardless of format, with related documentation, that are considered archived in accordance with the Archives Ordinance or other regulations issued by the archival authority." The report emphasizes that "all electronic records that are managed in the IT systems of the business are part of the e-archive."[68] The concept is illustrated in figure 1.
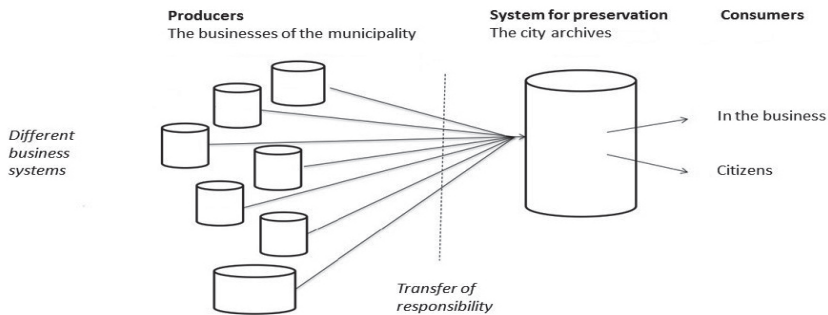

Figure 1: E-archive representation in Report A.

According to Report A, the business produces records that are eventually delivered to the municipal archive. The dotted line in figure 1 shows the transfer of responsibility, and thereby ownership, from the creating agency to the municipal archive, which then becomes responsible for preservation.

The report states that, although there are different definitions of the concept of the e-archive, there is a common goal for all: "the whole archiving chain should be cohesive and the final part be a system for preservation that makes safe and secure searches possible." The archive should be constructed as "a mirror image of the business."

Report A identifies as a problem the rapid development of information technology since the 1990s, and explains that this has changed the foundation of information management since the amount of information created has

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67 Riksarkivet, "Planera och styra" [Plan and Govern], accessed 3 March 2017, https://riksarkivet.se/planera-och-styra.

68 All citations from the reports are translated from Swedish to English by the authors.

increased exponentially, bringing with it a risk that overview and searchability will become difficult. Thus, practical archives management needs to be adapted to fit the pre-conditions that apply to the digital records. The vision of e-government is said to be "a coherent chain of case management in digital form." On the one hand, the e-archive is described as being similar to a paper archive: "An electronic archive (e-archive) basically has the same task as an analog archive: to receive, preserve, take care of and provide information. The difference is that an e-archive to a larger extent is integrated with the business and thereby can be used to develop and streamline the same." On the other hand, the e-archive is described as a novelty that differs from previous archives and that requires "review of existing steering documents and work processes" since new strategies need to be developed and existing ones revised to preserve digital information. Cross-organizational work is recommended, whereby municipal businesses, administrative leaders, IT departments, and archival functions co-operate. The report suggests that a systems management group with personnel from the municipal archive and the IT department be made responsible for establishing the strategies and work processes necessary to ensure long-term preservation and access. The municipal archive is expected to become more proactive in the description and control of the archives of its operations from the moment records are created, thereby facilitating the records' journey to the preservation system.

Report B

Report B uses a definition of e-archive that was developed by SALAR. In this report, an e-archive is:

a system for digital preservation of public records over time. In the e-archive the records are decoupled from the system in which they were created. It includes functions for inbound delivery, archiving, preservation, destruction, management, retrieval and disclosure. It ensures the maintenance of authenticity, reliability, integrity and usability of official records. Functions of the e-archive secure documents from data loss through validation and continuous controls and tests.[69]

The concept is illustrated in figure 2.

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69 SKL Kommentus, "E-arkiv 2013 projektnr: 10119 bilaga 2 – definitioner" [E-archive 2013, Project number 10119, Appendix 2 – Definitions], accessed 3 March 2017, https://www .sklkommentus.se/globalassets/inkopscentral/ramavtal/filer/e-arkiv/bilaga-2-definitioner -1.pdf.
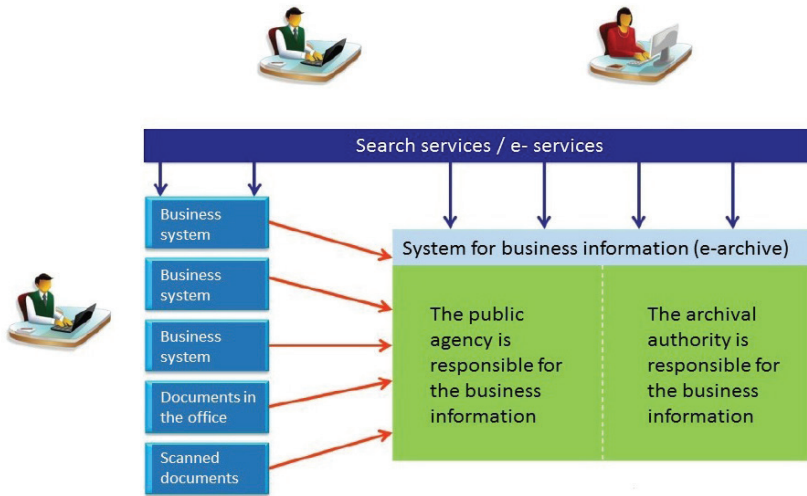
Figure 2: E-archive representation in Report B.

Report B distinguishes between "e-archive function" and "e-archive." The first refers to operational co-operation and the second to a technical solution. It is emphasized that none of the forms of co-operation relieve the municipalities of the legal requirement to maintain an archival authority of their own to ensure that municipal boards and municipally owned companies manage their information correctly. A few of the municipalities included in the pre-study have implemented archival solutions, mainly connected to single business systems. However, none of them are considered by the report authors as consistent with the definition used.

Report B suggests that the public sector is facing a paradigm shift from analog to digital information, but that many business systems lack the ability to destroy information and to transfer information to an e-archive. The report recommends that requirements regarding destruction and export functions be set when procuring new systems. According to Report B, e-archives should be understood as part of e-government and the digital society. The report argues that an important reason to implement an e-archive is the increased use of e-services that do not communicate directly with business systems. An e-archive would ensure that the information is preserved in a reliable way to meet legal demands. It would also improve search functions. Currently, digital information is stored in an unstructured way, making searches difficult, and in many cases only a few employees know how to navigate systems that are old or infrequently used.

In figure 2, the transfer of responsibility between the creating agency and the archival authority is illustrated with a dotted line in the middle of the box that depicts the e-archive. Report B states that archives management needs

to be adapted to current conditions, which change because of technological development; whereas previously information was to a large extent concentrated within the public agency's own operations and tied to more or less closed systems, now information is increasingly handled in a digital flow and tied to networks that are connected to the surrounding environment. However, the implications of a networked environment are not discussed, nor illustrated, in relation to the e-archive. A large part of the report is dedicated to discussing the pros and cons of different forms of co-operation involving municipalities and the county.

Report B states that there is no formal difference between analog and digital records, and thus it does not matter in which medium the records exist. Yet there are differences between the two types of records, one of the most relevant being how the information can be read and interpreted, which means that the information needs to be migrated or converted to new data carriers and formats so it can be read in the future. The report states that information must be "freed" from format and vendor dependencies by transfer to a system for long-term information supply. Report B references the OAIS model, stating that although there are several different methods for preserving information digitally, there is only one (OAIS) that is standardized and sustainable over time.

Report C

The project behind Report C has developed its own "step model" for a business-promoting e-archive. According to the model, the e-archive includes a "near achive," a "middle archive," and a "final archive." Each step implies transfer of information. The steps are described separately:

The *near archive* secures copies of original incoming matters. It is primarily used when a matter is active in the business. Large parts of the information still reside in the business systems, and the near archive provides security if something should fail.

The *middle archive* is where the business-promoting work primarily takes place. The e-archive acquires large parts of the information, preserves it, and prepares it for future destruction or transfer to the final archive. In this phase, the information is converted to archivally secure formats, which allows a simplified service for re-converting and sharing the information with other systems or externally with the citizens.

The *final archive* is the part that bears most similarity to contemporary paper-based archives management. Information transferred from the "middle archive" should have been assessed for retention or disposal and destruction, if appropriate, undertaken by authorized people. All metadata should be available and the information should be correctly classified. When the information is transferred to the final archive, the business's responsibility ends and it is cleared from the business systems. Information preserved in the final archive cannot be changed.

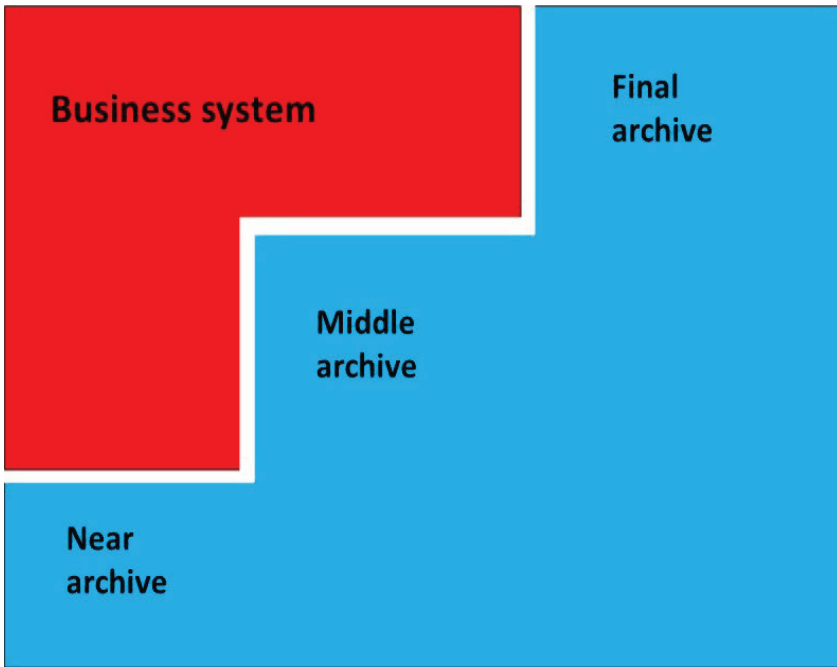Figure 3 shows the illustration for the e-archive as it appears in Report B.

Figure 3: E-archive representation in Report C.

The e-archive described in Report C should ensure information security, facilitate access to information for employees and citizens, facilitate the development of e-services, and improve the ability to create an overview and understanding of the information. This is said to speed up administration and searches for information, creating an improved and more efficient business. Report C suggests that the main challenge in managing, destroying, preserving, and making records available to the public is quantity. Co-operation is seen as the only option for an efficient implementation of an e-archive. The OAIS is referenced briefly in the report: "Established international standards such as the OAIS (Open Archival Information System) have been taken into consideration."

Another challenge raised is competence, which today is based on traditional archives management (paper records). Though digital records are created in the municipality in question, they are archived on paper because the municipality has no other way to preserve the records or provide the necessary statutory searchability. For example, emails are printed out and registered using a date stamp and a manually added registry number and serial number, thereby linking the email to a case or other content of which it forms a part. Records that are not archived in analog form are stored

directly in the business systems; these often do not have functionality for long-term preservation. This present situation is described as expensive, time-consuming, an obstruction to access, and a challenge to information security. The "human factor" is described as a risk that would decrease if digital information were preserved digitally. Legacy systems are also considered problematic. It is estimated that each year two of the current 325 business systems will need to be replaced, and each year the number of persons who knows how to use the old systems decreases, the hardware becomes increasingly expensive to keep in operation, and the software might not receive updates or support. System interdependencies and interrelations, as well as the regular introduction of new systems, is said to complicate the situation.

Analysis

The findings of the analysis of these pre-study reports are organized according to three principles that all public archives, regardless of format, should ensure: (i) a holistic concept of the archive, (ii) a proactive approach to records management, and (iii) a commitment to integrating the archiving process with the goals and opportunities of e-government. In this section of the article, we ask what the consequences are, in relation to these principles, of paper minds in the definitions and illustrations studied.

A holistic concept of the archive

The holistic approach to archives management implies that rather than thinking of records as progressing through different phases (active, semi-active, and archival), they should be seen to exist in a bidirectional, continuous flow. This flow may "begin" with archives creation at the public agency and "continue" to long-term preservation at an archival authority,[70] yet it may also "start" at the archival authority and "continue" on to administrative, cultural, or personal uses.[71] The age, location, or format of the records is irrelevant in this context: a text message sent a second ago could be as much a part of the archive as a map drawn 300 years ago. In the Swedish context, the "paper

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70 Lars Jörwall, Louise Lönnroth, and Gunilla Nordström, *Det globala minnet: Nedslag i den internationella arkivhistorien* [Global Memory: Examples from the International History of Archives], ed. Lars Jörwall, Louise Lönnroth, and Gunilla Nordström (Stockholm: Riksarkivet, 2012), 75.

71 Sue McKemmish, "Traces, Document, Record, Archive, Archives," *Archives: Recordkeeping in Society*, ed. Sue McKemmish, Michael Piggott, and Barbara Reid (Wagga Wagga, Australia: Centre for Information Studies, Charles Sturt University, 2005).

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way" of ensuring the incorporation of records into the archive has been manual registration of the date when a record was sent or received, a registry number linking the record to a case, a serial number indicating at what point the record was created in the case, and a short description of what the record concerns.

In these three pre-study reports, the concept of the e-archive varies. It is described as including all records managed by the public agency (also the ones still in business systems); only those records moved from business systems; or as a stepwise progression from the near archive to the final archive. Though a flow of information is indicated by arrows in the illustrations in two of the reports (see figures 1 and 2), both representations show the transfer of records from business systems as one-directional movement. Furthermore, all reports represent business systems as boxes or containers that are separate from one another and from the e-archive or "system for preservation." It is not made clear that public records are archival from the point of creation or receipt.

A proactive approach to recordkeeping

Proactive recordkeeping is an important part of the holistic concept of the archive. In the context of the case studied, the Swedish public administration, proactivity has been ensured by setting up registries so that all records can be assigned unique numbers, thereby making them searchable. Registries are often built on schedules that were developed at the beginning of the 20th century; they indicate to which categories records can belong (for example, protocols, accounts, and drawings). However, as the century progressed, the schedule became more and more difficult to work with, which is why the National Archives decided that, from 2013, all state public agencies should use process-based archival description. Regions and municipalities are still free to do as they choose.

The practical implementation of proactive recordkeeping in the digital world is still developing. One example of how the proactive approach can be translated into practice is the Swedish Tax Authority. It developed an e-archive solution so that it would meet the requirement to first archive cases and then administer them, thereby emphasizing the importance of planning for the incorporation of records into the archive before the records are created.[72]

Continuity from the creation of a record to long-term preservation is emphasized in all of the pre-study reports, and all three predict that planning will become increasingly important and need to be integrated more clearly into the creation of archival records. However, the consequences of concrete

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72 Robert Standéus, "E-arkivprojektet vid skatteverket" [E-Archive Project at the Tax Authority] (Malmö, Sweden, 2007).

measures (such as making requirements for destruction and export functions when procuring new business systems, implementing a more strategic steering of the archiving process, and implementing a cohesive use of metadata) are less clearly stated than the implications of e-archiving in relation to legacy systems, which are said to save economic resources, ensure the preservation of records that would otherwise be lost, facilitate searchability, and promote information security.

Furthermore, the way the e-archive, or system for preservation, is described and illustrated makes it seem more like a step in an administrative chain rather than a prerequisite for the same. This is perhaps most apparent in Report C, with its stepwise model, but it is also evident in Report A, where the system for preservation is shown as a large silo between producers and consumers, and in Report B, where the e-archive implies "a secure solution for receiving, preserving and making information accessible in the future." A motivation for transferring records from "active business systems" to an e-archive is that these need to be relieved of information. This way of reasoning is similar to the practice of relocating paper records when a storeroom becomes full. In the digital context, planning for preservation when a business system becomes "full" is too late; it needs to be done before such a system is even procured.

Integrating the archiving process with the goals and opportunities of e-government

The final principle of integrating the archiving process with the goals and opportunities of e-government is much newer than the previously discussed principles of a holistic concept of the archive and proactive recordkeeping. Despite this, the discourse on analog archives also shapes and colours this principle.

Each of the pre-study reports examined addresses the connection between digital archives and e-government. The present situation is described as challenging owing to technical developments, which cause rapid and significant changes of the context in which records are created. One of the reports especially emphasizes the importance of communicating the value and purpose of e-archiving to the business since it implies changes in the organizational culture. However, none of the illustrations show interrelations and information flows between business systems, though that is becoming more the rule than the exception. In today's administration, records are also created using e-services, something that is made explicit only in Report B. Transactions registered with the help of e-services have been described as "records created in a grey zone," where responsibilities for preservation are unclear.[73]

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73   Viveca Asproth, Erik Borglund, Göran Samuelsson, and Lena-Maria Öberg, "E-tjänstens

Though all three reports predict that the e-archive will become more integrated in the business, the existing practice – wherein the archive is a separate entity or organization – still shines through. According to Report A, the archive should ideally "mirror" the business and the digital archive should serve the same basic purpose as a paper archive. Report B seems to view the e-archive in a broader perspective, not just from the immediate context of the creating agency, when it states that e-archives are part of e-government and the digital society. Report C describes its organization's vision of the e-archive as promoting, not simply mirroring, the business, and says it should facilitate the development of e-services. However, in both Reports B and C, concrete suggestions for how to achieve these ideals are missing.

Discussion

Digital records and paper records are different in nature. The pre-study reports each have different ways of defining an e-archive and how it should be managed. The descriptions are influenced by practices created in a paper administration, which may not be ideal for upholding existing legal principles, and may affect future work and implemented solutions. The findings of this study indicate problematic differences regarding both what is categorized as an e-archive and how to translate into practice the three overarching principles of (i) a holistic concept of the archive, (ii) a proactive approach to records management, and (iii) a commitment to integrating the archiving process with the goals and opportunities of e-government. Some of the suggestions made show traces of the discourse on analog archives, which are less appropriate in the digital context.

It is possible to talk about a stage of confusion when the archive is about to take on a digital nature. From the point of view of critical theory, on the one hand, there is a need for shared understandings that support communication and co-operation, identify closings (i.e., specify what an e-archive is and what it is not), and show constructive consequences. On the other hand, there is a need for openings (i.e., reinterpretations of the concept of the archive in the digital environment), which may offer new ways to follow the principles of public archives management. However, some closings circumscribe the concept of the archive in a way that delimits the potential for making the

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framtida historia – informationsbevarande, ett bortglömt ansvarsområde?" [The Future History of the e-Service – the Preservation of Information, a Forgotten Area of Responsibility?" in *Förvaltning och medborgarskap i förändring: etablerad praxis och Kritiska Perspektiv* [Governance and Citizenship in Transition: Established Practice and Critical Perspectives], ed. Katarina Lindblad-Gidlund (Lund, Sweden: Studentlitteratur, 2010).

transfer from paper to digital as proactive and flexible as it needs to be in order to create societal value, cost-effectiveness, efficiency, searchability, legal security, openness, and e-government.

The benefits of an e-archive are described in similar ways in the three pre-study reports; all emphasize that citizens should be able to access information easily and all state that co-operation with other agencies is desirable, both within the organization (for example, though closer contact between the municipal archive and the agencies) and through different levels of co-operation among counties and municipalities. But the e-archive as such is described and illustrated in a multitude of ways: as all digital records managed in the business; as only those records set aside for archiving; as the end point of an administrative chain; as similar to, and also different from, an analog archive. If there had been a more explicit shared definition of the concept of the e-archive, it would have been easier for public agencies to discuss and decide on appropriate solutions. This would also make co-operation easier. At present, it is up to each agency to define the concept, which might then produce risks during the next phase, i.e., when the organization moves forward with planning to implement a system for preservation.

At the same time, the dominant discourse on public archives management is closing rather than opening the possibilities for new designs. One example is use of the concepts of near archive, middle archive, and final archive, which lead one to imagine separate digital "storerooms." An earlier report authored for a project run by SALAR instead emphasizes that a middle archive and a final archive may well be the same technical solution but with differing information owners: "Information ownership in the final archive is held by the archive authority, while the business owns the information in the middle archive. Thus it does not have to be two separate archives."[74] The dominant story of status of the final versus the middle archive restrains the translation and enactment of archive management in the digital context.

All three reports predict that in Sweden the municipal archive will become more involved in the recordkeeping process. The notion of the archival authority as an expert agency is described as a novelty, though the idea derives from the beginning of the 20th century, when the Swedish archival system was reformed and modernized and the principle of provenance introduced. Detailed rules regarding classification, registration, cataloguing, destruction, and management of official records were issued and implemented nationwide.

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74 Center för eSamhället (CeSam) [Centre for the E-society], *Vägledning för Kraven i Ramavtal för E-Arkiv* [Guidance on the Requirements of the Framework for e-Archives] (Stockholm: SALAR, 2014).

Although in principle the work of archival authorities remains the same, as Bengt Danielson and Alan Crozier have argued, the relationship between records creators and archival authorities is changing and becoming increasingly complex.[75]

Conclusion

The research questions posed in this article were:
- What norms and elements of the analog concept of the archive might "travel" into the discourse on digital archives?
- How might these norms and elements affect the plans for creating digital archives?

The results show that, although there are shared principles and practices on a general level, there is no common definition of the concept of the e-archive, leaving the authors of the pre-study reports with little support for identifying the implications in creating a digital archive. Consequently, elements of present (analog) practices, such as progression between different "storerooms," are used as the starting point when illustrating and describing an e-archive. Paradoxes exist: firstly, between the slow-moving and fixed constructions of legal principles; secondly, in the story of a holistic, proactive approach that is supportive of e-government; and thirdly, between the general and shared story on the surface and the differences underneath, including different understandings of what a digital archive is, could be, or should be.

The result of the study supports the need for a clarifying definition of an e-archive and how archives management could be organized in the digital environment. A possible conclusion is that public agencies would benefit from taking a more holistic, proactive, better-informed view of archival systems, rather than implementing technical solutions to fulfill certain predefined purposes that assume obsolete procedures developed in the paper administration. It will otherwise be difficult to meet the demands of e-government, including co-operation among different agencies. The overall result indicates the importance of recognizing that this demand for a shared definition should be directed toward a shared clarification regarding principles if we want to create and support innovative and context-dependent value for society. It is crucial to focus on the principles to which public archives should adhere, rather than on existing practices, since the preferred result might not be supported by current normative routines.

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75 Bengt Danielson and Alan Crozier, "The Art of Closing Archives: Some Aspects of Centrally Directed Archives Creation in the State Administration of Sweden," *Comma* 2004, no. 1 (2004): 163–71.

Though forms of closings are needed regarding, for example, what an e-archive is and what it is not, some closings may be counterproductive, circumscribing the concept of the archive in such a way that they delimit the potential for making the transfer from paper to digital as proactive and flexible as it needs to be in order to create societal value, cost-effectiveness, efficiency, searchability, legal security, openness, and e-government. Therefore, openings toward new conceptualizations and ways of working are needed. Openings could lead to well-integrated administrative and archival systems that meet both business and legal requirements; archival search systems that instill confidence among business users because they truly mirror the business processes they know and understand; and seamless access for business users across a completely holistic archive. By reimagining the concept of the archive in the digital environment, the public sector would be better equipped to adapt procedures to current conditions. For example, records created in e-services could be captured into the e-archive much sooner than at the point when the originating system needs to be relieved of information; the implications of a networked environment could become more visible in illustrations and plans for how to manage the records originating in that context; and issues surrounding what formats are appropriate could be discussed and decided before records are created, instead of at the point of transfer for long-term preservation. The archive as a clearly distinguishable "box" containing records is an unfortunate image since it shows separation between the business in which records are created and used, risking "archival issues" that are questions only for records managers and archivists, rather than challenges that agencies in their entirety need to address, and obscuring the possibility of considering records as archival right from the point of creation. The possibilities of reuse are more wide-ranging for digital records, a fact that needs to be taken into consideration for reasons of transparency and security, whether that be to protect privacy or classified information. Showing the flow of information as a bidirectional movement, rather than a one-way street where the archive is the "end," would highlight the possibilities of reusing and recreating records for the benefit of the business or, in a wider context, society.

More research is needed about how to reimagine the digital archive. What would a set of clarifying principles that could support and guide the creation of an e-archive with real social value look like? What would it mean to open the possibilities for new designs? And what would emerge from a design that followed principles rather than practice? The authors hope that this article can provide some direction to researchers who wish to continue this line of inquiry.

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